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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/585,479	07/10/2006	Takeo Kanamori	2006-1109A	5897
52349 7590 09/28/2009 WENDEROTH, LIND & PONACK L.L.P. 1030 15th Street, N.W. Suite 400 East Washington, DC 20005-1503				
EXAMINER				
LEE, PING				
ART UNIT		PAPER NUMBER		
2614				
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/585,479

**Applicant(s)**

KANAMORI ET AL.

**Examiner**

Ping Lee

**Art Unit**

2614

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 10 July 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-4 and 7-11 is/are rejected.
- 7) ☒ Claim(s) 5 and 6 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☒ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/CS-100)
- Paper No(s)/Mail Date \_\_\_\_\_

- 4) ☐ Interview Summary (PTO-413)
- Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Drawings***

1. Figures 7 and 8 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Claim Rejections - 35 USC § 101***

2. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

3. Claim 9 is rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. The claim 9 claims a howling suppression program. A computer program per se is a not one of the four statutory class for patent.

### ***Claim Rejections - 35 USC § 112***

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claim 3 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 3 includes the limitation of claim 1. In claim 3, it is stated that "by connecting a line", so "a signal output from the amplification section is output to the second power spectrum information producing section as the second acoustic signal". In claim 1, it is stated that "second acoustic signal obtaining means for obtaining a second acoustic signal of a sound". A sound is an acoustic wave in the air, as corresponding to applicant's disclosure. However, a signal at "a line" from the amplification section" is an electrical signal. Therefore, the signal in claim 3 does not correspond to the same signal in claim 1.

***Claim Rejections - 35 USC § 102***

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claim 3 is rejected under 35 U.S.C. 102(b) as being anticipated by Ito (US006442280B1).

In view of the 112, 2<sup>nd</sup> paragraph as stated above, claim 3 has been rejected based on the assumption that the second acoustic signal obtaining means is a line.

Regarding claim 3, Ito discloses a howling suppression device for suppressing howling, which occurs when amplifying a target sound collected by a first microphone (1) through an amplification section (7) and outputting the amplified sound as an intensified sound from a loudspeaker (2), the howling suppression device comprising:

a first power spectrum information producing section (19 in Fig. 5) for producing a first power spectrum according to a first acoustic signal output ( $x(t)$ ) from the first microphone collecting a sound;

second acoustic signal obtaining means (as shown in Fig. 1,  $y(t)$  to element 8) for obtaining a second acoustic signal, that signal represents at least the intensified sound and not the target sound;

a second power spectrum information producing section (24 in Fig. 5) for producing a second power spectrum according to the second acoustic signal ( $y(t)$ ); and

a suppression filter section (6 and 9 in Fig. 1) for filtering the first acoustic signal based on the first power spectrum and the second power spectrum to output only an acoustic signal of the target sound to the amplification section;

wherein the second acoustic signal obtaining means is realized by connecting a line between the amplification section (7) and the loudspeaker (2) with the second power spectrum information producing section (24) so that a signal output from the amplification section is output to the second power spectrum information producing section as the second acoustic signal.

***Claim Rejections - 35 USC § 103***

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

10. Claims 1, 2 and 7-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ito in view of Pedersen (US 20020154785A1).

In view of 112, 2<sup>nd</sup> paragraph rejection above, claim 1 has been rejected based on the assumption that second acoustic signal obtaining means obtaining a sound.

Ito has been discussed above.

Regarding claims 1, 2 and 11, Ito fails to show that the second acoustic signal obtaining means obtaining a sound including at least the intensified sound and not including the target sound. It was well known in the art that a loudspeaker, such as loudspeaker 2 in Ito, is not a linear device. The signal,  $y(t)$ , in Ito represents the signal

applied to the loudspeaker (2), however,  $y(t)$  is not directly proportional to the sound generated by the loudspeaker (2). Pedersen teaches a method of providing a microphone that is near the diaphragm of the loudspeaker to faithfully measure the actual sound generated by the loudspeaker. One skilled in the art would have expected that the microphone in Pedersen would not pick up the environmental noise. Even if there is environmental noise, it would be minimum comparing with the sound generated from the loudspeaker. Thus, it would have been obvious to one of ordinary skill in the art to modify Ito in view of Pedersen by replacing the line for supplying the second acoustic signal with a microphone for directly measuring the loudspeaker sound in order to obtain the truly signal representing the potential feedback to be picked up by the original microphone and thus avoid the howling.

Regarding claim 8, Ito fails to show a spectral subtraction method. Ito teaches using an EQ to attenuate the howling component. However, one skilled in the art would have expected that EQ could be replaced with other well known device, including spectral subtraction, as long as the howling frequency is determined. Examiner takes Official Notice that this feature is notoriously well known in the art. Thus, it would have been obvious to one of ordinary skill in the art to modify Ito and Pedersen by using well known spectral subtraction to remove the howling from the microphone input signal. Regarding claim 9, Ito fails to show a computer program executed by a computer for suppressing the howling. Ito teaches signal processing (see Fig. 4 and col. 5-6). One skilled in the art would have expected that the process could be implemented by a computer program to be executed by a computer to solve the mathematical equations

and finding the howling and attenuating it. Examiner takes Official Notice that this feature is notoriously well known in the art. Thus, it would have been obvious to one of ordinary skill in the art to modify Ito and Pedersen by implementing the howling reducing process using a computer program in order to use a computer to perform the calculation and reduce the howling.

Regarding claim 10, the claimed "integrated circuit" reads on the computer which has been discussed above with respect to claim 9.

11. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ito and Pedersen as applied to claims 1 and 2 above, and further in view of Danielsen et al. (hereafter Danielsen) (US007155022B2).

Regarding claim 4, Ito discloses an apparatus for reducing howling based on cross-spectrum method. However, Ito fails to show the combination of a signal-to-signal delay detecting section and a signal delaying section. Danielsen teaches that when utilizing cross-spectrum techniques (col. 3, line 26), a delay representing the time between the input sensor (1) and the second acoustic signal (4) should be inserted (by element 6; col. 3, lines 5-16). Ito teaches for another embodiment how to measure the time delay (Fig. 5). Thus, it would have been obvious to one of ordinary skill in the art to modify Ito and Pedersen in view of Danielsen by detecting the delay and inserting the delay for the second acoustic signal in order to properly determine the howling and eliminate such howling.



12. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ito and Pedersen as applied to claims 1 and 2 above, and further in view of Benesty et al. (hereafter Benesty) (US007310425B1).

Regarding claim 7, Ito fails to show a Wiener filter. Ito teaches general equations for deriving the function  $h(t)$ . Benesty teaches that one could derive the Weiner solution for the adaptive filter based on the cross-spectrum (Ito teaches such). Thus, it would have been obvious to one of ordinary skill in the art to modify Ito and Pedersen in view of Benesty by obtaining the Weiner solution in order to determine the howling.

***Allowable Subject Matter***

13. Claims 5 and 6 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ping Lee whose telephone number is 571-272-7522. The examiner can normally be reached on Wednesday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vivian C. Chin can be reached on 571-272-7848. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Ping Lee/  
Primary Examiner, Art Unit 2614

pwl